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ABSTRACT

Secondary science education resources of graduate and undergraduate teacher education institutions in New England were compared. A 72-item survey was mailed to library directors of these institutions. There was a 75 percent response rate from the 56 institutions that prepare secondary science teachers. Of the 42 responding institutions, 19 had graduate education programs. Differences were found between indexes and journals in graduate and undergraduate libraries. Significant differences were found for education indexes, science indexes, science education journals, and non-science education journals. There was no significant difference for science journals. Library resources available for preservice secondary science education were inadequate with the exception of science reference books. The lack of science education and non-science education journals could reflect the priority given to education and/or educational research at these responding institutions. Another concern is the low priority given to education and science indexes at many New England institutions. Consequently, many graduates are unacquainted with the current resources that could be utilized to improve their teaching skills and update their science content information. Science educators should also ascertain the quality of their library's resources for promoting research. If any resources are lacking, they should be requested, thereby facilitating the preparation of future secondary science teachers. (Author/JN)

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RESOURCES AT NEW ENGLAND'S TEACHER EDUCATION PROGRAMS

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Biographical Resume

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ABSTRACT

Secondary Science Education Library Resources At New England's Teacher Education Programs

The purpose of this study was to compare secondary science education resources of graduate and undergraduate teacher education institutions in New England. A 72-item mailed survey was sent to library directors of New England institutions. There was a 75% return rate from the 56 teacher education institutions that prepare secondary science teachers. Prepared programs from SPSSX were utilized for data analysis. Of the 42 responding institutions, 19 had graduate education programs.

Differences were found between indexes and journals in graduate and undergraduate New England libraries. Significant differences were found for education indexes, science indexes, science education journals, and non-science education journals. There was no significant differences for science journals. Library resources available for preservice secondary science education was inadequate with the exception of science reference books.

The lack of science education and non-science education journals could reflect the priority given to education and/or educational research at these responding institutions. Another concern is the low priority given to education and science indexes at many New England institutions. Consequently, many graduates are unacquainted with the current resources that could be utilized to improve their teaching skills and update their science content information. Science educators should ascertain the quality of their library's resources for promoting research. If any of the above resources are lacking, they should be requested, thereby facilitating the preparation of future secondary science teachers.

Secondary Science Education Library Resources at New England's Teacher Education Programs

Introduction

During the 1970's, the National Science Foundation (NSF) sponsored three major status studies concerning various aspects of science: Helgeson, Blosser, and Howe (1977) conducted a literature search from 1955-75; Stake and Easley (1978) collected in-depth case studies at several school systems throughout the nation; and Weiss (1978) conducted a comprehensive survey of teachers, school administrators, and curriculum coordinators. These studies found that a large percentage of science classrooms relied more heavily on textbooks, recitations, and teacher-directed activities rather than on inquiry strategies. These studies raised concerns about the way preservice teachers are prepared.

A quality preservice science education can be facilitated by a campus library. Yager's study (1982) of graduate science education programs did not ascertain information about library resources. An ERIC computer search found only one published report on library resources as they relate to science education. That study focused upon elementary science preservice preparation (Barrow, 1985).

Procedures

The purpose of this study was to compare secondary science education library resources of graduate and undergraduate teacher education institutions in New England. A 72-item survey was developed for library directors of New England institutions. The instrument was a modification of Barrow's survey (1984). The survey instrument with cover letter and self-addressed stamped envelope was sent during April, 1985. Two weeks later all non-respondents received a follow-up letter, survey, and self-addressed stamped envelope.

Berty's (1979) guidelines were followed in processing the survey. There was a 75% return rate from the 56 teacher education institutions of New England that had certified secondary education programs.

Prepared programs from the Statistical Package for the Social Sciences (SPSSX, 1983) were utilized for data analysis. Of the 42 responding institutions, 19 (45.7%) had graduate education programs.

Results

Differences were found between graduate and undergraduate institutions. More than 80% of the responding graduate institutions had Education Index, CIJE, Resources in Education, ERIC microfiche available, Dissertations Abstracts, and computer search capabilities available, while only Education Index and Resources in Education were available at more than 75% of the non-graduate institutions. More than 60% of the graduate institutions had Applied Science and Technology Index, Biological Abstracts, Chemical Abstracts, and General Science Index, while only General Science Index was available at more than 60% of the undergraduate institutions. American Biology Teacher, Journal of Chemical Education, Journal of Research in Science Teaching, Physics Teacher, Physics Today, School Science and Math, Science Education, and Science Teacher were the only science education journals available at more than 75% of the graduate institutions. American Biology Teacher, Journal of Chemical Education, Physics Teacher, Physics Today, and Science Teacher were the only science education journals at 60% of the undergraduate institutions. The science journals at more than 75% of the graduate institutions were American Scientist, National Geographic, Science, Science Digest, Science News, Scientific American, Sky and Telescope, and Smithsonian. While National Geograhic, Science, Science News, Scientific American, Sky and Telescope, and Smithsonian were

available at more than 75% of undergraduate institutions. Clearing House, Health Education, Journal of Learning Disabilities, Journal of Physical Education, Recreation and Dance, Journal of Research in Reading, Journal of School Health, Journal of Special Education, Language Arts, Library Journal, Mathematics Teacher, Scholastic Coach, Social Education, Social Studies, and Today's Education were available at more than 75% of graduate institutions. Library Journal, Mathematics Teacher, and Today's Education were the only non-science education journals available at more than 75% of the non-graduate institutes (Table 1).

The results of this survey found library resources available for preservice secondary science education programs to be inadequate with the exception of science reference books at both the graduate and non-graduate institutions. Regarding science computer software, both graduate and non-graduate institutions were severly lacking (Table 2).

Differences between indexes and journals in graduate and undergraduate New England libraries are found in Table 3. Significant differences were found for education indexes, science indexes, science education journals and non-science education journals. There was no significant difference for science journals.

Insert Tables 1-3 about here

Conclusions and Implications

Since there has been only one published article on science education library resources, which focused upon the elementary level, it is difficult to determine whether New England's preservice secondary science resources are typical or atypical.

The lack of science education and non-science education journals could reflect the priority given to education and/or educational research at these responding institutions. Another concern is the low priority given to education and science indexes at many institutions of higher education. Consequently, many graduates are unacquainted with the current resources that could be utilized to improve their teaching skills and update their content information.

Additional studies should be undertaken to determine the quality of graduate education at institutions which fail to provide ERIC microfiche, Resources in Education, Dissertation Abstracts International, and computer search capabilities. Aren't these resources essential for graduate students and faculty to be active participants in research? It is unfortunate that only slightly more than half (54%) of the respondents have Journal of Research in Science Teaching available to their libraries. About 1/3 of the undergraduate institutions fail to have The Science Teacher available for their preservice science teachers. With the renewed interest in science, it is discouraging to note that only about half of the institutions receive Discover, Omni, or Science 85. The wide diversity in responses to the non-science education journals could be due to emphasis on specialization of secondary education at those institutions. Overall, the availability of specialty journal in science education and other areas of education is lacking for both graduate and undergraduate institutions. This limitation fails to encourage preservice students to utilize the library to its maximum.

Librarians were aware of the need to improve science education at their respective institutions. In response to an open-ended question about their top five priorities, the respondents identified computer software and audio-visual aids as the top two priorities, thereby, facilitating preservice secondary science education (Table 4).

Insert Table 4 about here

This study identified that New England higher education institutions need to improve the education indexes, science indexes, science education journals, and non-science education journals. As urged in an earlier study (Barrow, 1984), science educators should ascertain the quality of their library's resources for promoting research. If any of the above resources are lacking, they should be requested, thereby facilitating the preparation of future secondary science teachers.

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Table 1

Indexes, Science Education Journals, Science Journals, and Non-Science Education Journals Available at New England Graduate and Non-Graduate Teacher Education Institutions

	Graduate		Non-Graduate Program		No Response	
	n	%	n	%	n	%
Indexes						
Education						
Education Index	17	89.5	22	100.0	1	2.4
CIJE	17	89.5	13	68.4	4	9.6
Resources in Education	16	84.2	17	85.0	3	7.2
ERIC microfiche	17	89.5	6	33.3	5	12.0
Dissertation Abstracts	16	84.2	15	71.4	2	4.8
Computer search capabilities	15	78.9	13	68.4	8	19.2
Science						
Applied Science and Index	16	84.2	11	57.9	4	9.6
Biological Abstracts	15	78.9	11	57.9	4	9.6
Biological and Agriculture Index	11	57.9	8	42.1	4	9.6
Biology Digest	8	42.1	4	21.1	4	9.6
Chemical Abstracts	14	73.7	9	47.4	4	9.6
Environmental Index	9	47.4	5	26.3	4	9.6
General Science Index	13	68.4	15	71.4	2	4.8
Physics Abstracts	10	52.6	6	31.6	4	9.6
Journals						
Science Education						
American Biology Teacher	18	94.7	14	63.6	1	2.4
Current: Journal of Marine Education	3	15.8	1	5.0	3	7.2

Geotimes	10	52.6	6	30.0	3	7.2
Journal of Biological Education	5	26.3	2	10.0	3	7.2
Journal of Chemical Education	17	89.5	18	85.7	2	4.8
Journal of Computers in Math/Science Teaching	8	42.1	1	5.0	3	7.2
Journal of Environmental Education	11	57.9	6	30.0	3	7.2
Journal of Geological Education	10	52.6	6	30.0	3	7.2
Journal of Research in Science Teaching	15	83.3	5	25.5	4	9.6
Physics Teacher	17	89.5	12	60.0	3	7.2
Physics Today	15	78.9	16	80.0	3	7.2
School Science and Math	18	94.7	12	57.1	2	4.8
Science Activities	6	33.3	2	9.5	3	7.2
Science Education	18	94.7	7	35.0	3	7.2
Science Teacher	19	100.0	14	64.7	2	4.8
Science						
American Scientist	16	84.2	13	65.0	3	7.2
Chemical and Engineering News	14	73.7	14	66.7	2	4.8
Discover	11	57.9	7	33.3	2	4.8
Man/Society/Technology	8	42.1	0	0.0	3	7.2
National Geographic	17	89.5	22	100.0	1	2.4
National Wildlife	11	57.9	13	59.1	1	2.4
Omni	5	26.3	9	45.0	3	7.2
Science	18	94.7	21	95.5	1	2.4
Science 85	10	55.6	12	54.5	2	4.8
Science Digest	15	78.9	15	71.4	2	4.8
Science News	18	94.7	18	81.8	1	2.4

Scientific American	18	94.7	22	100.0	1	2.4
Sky and Telescope	17	89.5	15	75.0	3	7.2
Smithsonian	17	89.5	20	90.9	1	2.4
Weatherwise	13	68.4	6	30.0	3	7.2
Non-Science Education						
Clearing House	18	94.7	11	52.4	2	4.8
English Education	8	42.1	2	10.0	3	7.2
Forecast for Home Economics	6	31.6	2	10.0	3	7.2
Health Education	17	89.5	6	30.0	3	7.2
High School Journal	12	63.2	9	45.0	3	7.2
History Teacher	11	57.9	12	54.5	1	2.4
Journal of Business Education	12	63.2	5	23.8	2	4.8
Journal of Counseling and Development	12	63.2	12	54.5	1	2.4
Journal of Industrial Teacher Education	4	21.1	0	0.0	3	7.2
Journal of Learning Disabilities	18	94.7	16	72.7	1	2.4
Journal of Physical Education Recreation and Dance	16	84.2	14	70.0	3	7.2
Journal of Reading	17	89.5	14	63.3	1	2.4
Journal of Research in Reading	17	89.5	14	63.6	1	2.4
Journal of School Health	16	88.9	10	47.6	3	7.2
Journal of Special Education	16	84.2	12	54.5	1	2.4
Language Arts	18	94.7	16	72.7	1	2.4
Library Journal	18	94.7	21	94.4	1	2.4
Mathematics Teacher	18	94.7	19	84.4	1	2.4
Middle School Teacher	0	0.0	0	0.0	3	7.2
Scholastic Coach	15	89.5	15	68.2	1	2.4
Social Education	17	89.5	15	68.2	1	2.4

Social Studies	18	94.7	8	38.1	2	4.8
Today's Education	18	94.7	19	90.5	2	4.8

Table 2

Librarian's Perceived Adequacies of Resources at New England's Graduate and Non-Graduate Teacher Education Institutions

	More than adequate		Adequate		Inadequate		Not Available	
	n	%	n	%	n	%	n	%
Secondary Science Textbooks								
Graduate	3	16.7	5	27.8	4	22.2	6	33.3
Non-Graduate	2	10.0	8	40.0	5	25.0	5	25.0
Resources File on current science topics								
Graduate	1	5.3	6	31.6	5	26.3	7	36.8
Non-Graduate	1	5.3	7	36.8	7	36.8	4	21.1
Science reference books								
Graduate	8	42.1	8	42.1	2	10.5	1	5.3
Non-Graduate	10	47.6	9	42.9	2	9.5	0	0.0
Audio-visual materials for science								
Graduate	2	11.8	4	23.5	9	52.9	2	11.8
Non-Graduate	2	10.5	9	47.4	5	26.3	3	15.8
Computer software for science								
Graduate	0	0.0	2	12.5	4	25.0	10	62.5
Non-Graduate	4	21.1	1	5.3	4	21.1	10	52.6

Table 3

One Way ANOVA of Education Indexes, Science Indexes, Science Education Journals, Science Journals, and Non-Science Education Journals by Graduate Programs

Source	df	ss	MS	F	p
Education Indexes					
Between Groups	1	15.90	15.90	7.02	.0116
Within Groups	39	88.34	2.27		
Total	40	104.24			
Science Indexes					
Between Groups	1	37.44	37.44	6.90	.0122
Within Groups	39	211.54	5.42		
Total	40	248.98			
Science Education Journals					
Between Groups	1	202.30	202.30	25.83	.0000
Within Groups	39	305.46	7.83		
Total	40	507.76			
Science Journals					
Between Groups	1	24.12	24.12	3.29	.0775
Within Groups	39	286,27	7.34		
Total	40	310.39			
Non-Science Education Journals					
Between Groups	1	356.28	356.28	18.19	.0001
Within Groups	39	763.97	19.59		
Total	40	1120.24			

Table 4

Composite Rating of Top Five Concerns for Libraries

Concern	Frequency
Computer software	17
Audiovisual	11
Curricular aids for science	11
Current editions of secondary science textbooks	5
Additional science/science education journals	5
Science curriculum guides	3
Campus-wide resources	2
Computer search capabilities	2
Additional computer terminals	1
Interfacing computers and media	1
Additional science indexes	1
Additional history of science resources	1
Equipment for making transparencies, masters, etc.	1